STATUS OF CLAIMS

Claims 1-34 are pending.

Claims 1-34 stand rejected by the Examiner.

Claim 12 stand objected to.

Claims 1, 2, 9 and 25 have been amended without prejudice herein.

Claims 12-21 have been cancelled without prejudice herein.

REMARKS

Reconsideration of the present application is respectfully requested.

Claim Objections

Claims 12-21 have been cancelled without prejudice herein, subject to Applicant's right to seek further prosecution thereof in this or a related application. Accordingly, the objection to Claim 12 is deemed moot. Further, the provisional objections to Claims 12-21 are likewise moot.

Claim Amendments

Claims 1 and 2 have been amended to recite, *inter alia*, "outputting an indication of measured fluid velocity dependently upon the reducing" and "outputting an indication of measured fluid velocity dependently upon the determining", respectively. Support for such steps may be found throughout the specification, such as at paragraphs [0048] – [0051] of the specification as filed.

Thereat, it explains that FIGs. 7A and 7B show corrected and uncorrected velocities for the flow data shown in the earlier figures. FIG. 7B shows the expanded view of the velocity shown in FIG. 7A. Further, it explains that FIGS. 8A and 8B show the same correction process applied in vivo on a velocity measurement of blood flow in a dialysis-access graft.

Further, FIGs. 8A and 8B show the constant-angle-corrected (cac) velocity and uncorrected velocity measured by the prototype instrument on blood flow in a dialysis access graft. FIG. 8A shows a two (2) second recording, and FIG. 8B shows an expanded view of the uncorrected (dotted trace) and corrected (solid trace) velocity calculated, illustrating the effect of the constant-angle-correction method. The correction process can be used because, while the velocity is variable in time (e.g., with the beating of the heart), the transducer system is held steadily over the graft during this measurement, so the orientation of the velocity vector does not change. The corrected velocity,

shown as the solid trace in FIG. 8B, is more consistent with hemodynamic fluid flow and so is believed to be closer to the true velocity. Accordingly, no new matter has been added.

Applicant has also amended Claim 2, without prejudice, to include limitations present in original Claim 1. Accordingly, no new matter has been added.

Applicant has also amended Claim 9, without prejudice, to be independent in form. Accordingly, no new matter has been added.

Applicant has also amended Claim 25, without prejudice, to include a limitation present in original Claim 22. Accordingly, no new matter has been added.

35 U.S.C. 101 Claim Rejections

Claims 1-21 stand rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter. Claims 1 and 2 having been amended, this rejection is respectfully traversed. Reconsideration and removal of this rejection is requested.

As no other grounds for rejecting Claim 9 have been presented, and as Claim 9 has been amended to be independent in form, Applicant submits at least Claim 9 is therefore in condition for allowance, an early notification of which is earnestly solicited.

35 U.S.C. 102 and 103 Claim Rejections

Claims 1-7, 10-17, 20-30, 33 and 34 stand rejected under 35 U.S.C. §102 as being anticipated by Beach (United States Patent No. 5,409,010). Claims 8, 18 and 31 stand rejected under 35 U.S.C. §103 as being unpatentable over Beach in view of Magnin (United States Patent No. 4,671,294). Applicant traverses, and requests reconsideration and removal of these rejections for at least the following reasons.

A claim is anticipated pursuant to 35 U.S.C. 102 only if each and every element set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *See, Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)).* In other words, in order for a prior art reference to anticipate a claim, "the identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).* And, each of the claim elements must be arranged as required by the claim. *See, In re Bond, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).*

Applicant submits Beach fails to teach or suggest each of the limitations of Claim 1, such that Claim 1 is patentable thereover, for at least the following reasons. The subject application explains, such as at paragraph [0051], that the method of the present invention improves vector Doppler velocity measurements by using information about the constancy of its angle to reduce the effects of the intrinsic power variability of Doppler signals. Consistently, Claim 1 recites, *inter alia*, "obtaining information about angle constancy; [and] reducing the effects of intrinsic power variability of Doppler frequency determination by using the information about angle constancy." Beach fails to teach or suggest using information about the constancy of angle to reduce the effects of the intrinsic power variability of Doppler signals.

More particularly, the Examiner cites Beach's calculation of angle and magnitude of the velocity vector; which teaches how to calculate the velocity and angle from multiple Doppler signals. The "corrected" velocities of Beach refer to corrections of undesired frequency intersections that result from his disclosed configuration.

Beach refers only briefly to the effect of the intrinsic noise of a Doppler signal (arising from the random location and orientation of blood cells in the insonated vessel). The Beach "corrections" do not account for, or even refer to, the effect of this statistical fluctuation. In contrast, the subject application recognizes intrinsic noise (statistical fluctuation) of Doppler signals, and teaches how to correct for velocity errors produced by that intrinsic variance of the Doppler signal. This is entirely different from the "corrections" Beach teaches, which relate to incorrect intersections that arise from a 4-receiver configuration. The Beach corrections have nothing to do with the angular constancy based error-correction – as is recited by Claim 1.

Accordingly, Applicant requests reconsideration and removal of the rejection of Claim 1, as Beach fails to teach each of the limitations thereof – namely, at least "obtaining information about angle constancy; [and] reducing the effects of intrinsic power variability of Doppler frequency determination by using the information about angle constancy."

Turning now to amended Claim 2, it recites, *inter alia*, "calculating angular positions of a velocity vector characterizing motion of the fluid velocity, each angular position calculated from the at least two peak Doppler frequencies of each of the Doppler spectra; obtaining information about angle constancy; [and] determining a true angular position of the velocity vector from the calculated angular positions using the information about angular constancy." Again, Beach fails to teach or suggest angular constancy based error-correction. Accordingly, Applicant submits amended Claim

2 is similarly distinct over Beach. Thus, Applicant requests reconsideration and removal of the rejection thereof as well.

Applicant also requests reconsideration and removal of the rejections of Claims 3-11 as well, at least by virtue of these claims' ultimate dependency upon a patentably distinct base Claim 2.

Turning now to Claim 22, it analogously recites, *inter alia*, "means for using constancy of a velocity vector spatial orientation from the measurement to correct for errors due to a random power characteristic of the Doppler signal." Again, Beach fails to teach or suggest angular constancy based error-correction. Accordingly, Applicant submits amended Claim 22 is similarly distinct over Beach. Thus, Applicant requests reconsideration and removal of the rejection thereof as well.

Applicant also requests reconsideration and removal of the rejections of Claims 23-24 as well, at least by virtue of these claims' ultimate dependency upon a patentably distinct base Claim 22.

Turning now to amended Claim 25, it recites, *inter alia*, "means for determining a true angular position of the velocity vector from the calculated angular positions using information about angular constancy." Again, Beach fails to teach or suggest angular constancy based error-correction. Accordingly, Applicant submits amended Claim 25 is similarly distinct over Beach. Thus, Applicant requests reconsideration and removal of the rejection thereof as well.

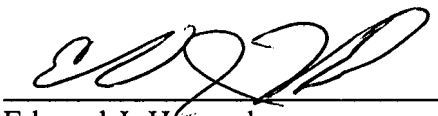
Finally, Applicant also requests reconsideration and removal of the rejections of Claims 26-34 as well, at least by virtue of these claims' ultimate dependency upon a patentably distinct base Claim 25.

CONCLUSION

In view of the foregoing, Applicant believes that all outstanding grounds raised by the Examiner have been addressed and respectfully submits the present case is in condition for allowance, early notification of which is earnestly solicited.

Should there be any questions or outstanding matters, the Examiner is cordially invited and requested to contact Applicant's undersigned attorney at his number listed below.

Respectfully submitted,



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